

Newer Drugs (and non-drugs) of Abuse

*Cyrus Rangan MD
Medical Toxicology Consultant, Childrens Hospital Los Angeles
Assistant Medical Director, California Poison Control System
Director, Bureau of Toxicology and Environmental Assessment, LA County
Public Health*

Newer Perspectives on Teen Drug Abuse

- Pattern and impetus for trying newer drugs is dynamic
 - curiosity for new substances
 - reduced availability of other drugs; availability of new ones
 - potential to evade toxicology screens
- Most newer drugs not found on standard toxicology screens; send-out testing not widely available – diagnosis and treatment is based primarily on history and physical

Trend in Teen Substance abuse

- Natural substances
- Synthetic derivatives of known drugs
- Novel methods of using “older” drugs
- Social media, “dares”, boredom, “just for fun” are the driving forces
- Poisoning death rate among teens aged 15–19 years nearly doubled, from 1.7 to 3.3 per 100,000 from 2000-2009

Newer Drugs of Abuse

- Most everything can be purchased over the internet, despite emerging laws and regulations



Ecstasy

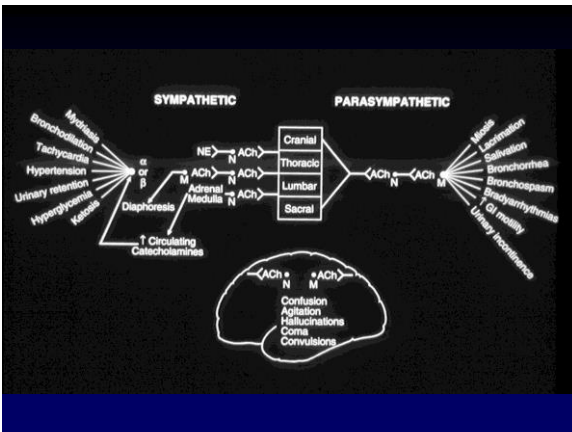
E, MDMA, XTC, X, Doves, X-Men, Adam

- Manufactured in Germany in 1912
- Most popular party drug
- Available in pills and capsules
- Increases water intake, teeth grinding
- Many clones
- Misrepresentation/adulteration common

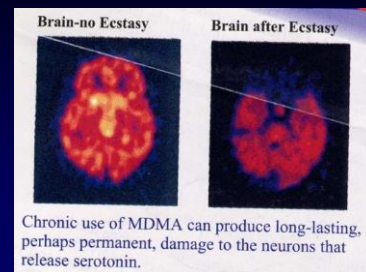
Ecstasy

Presentation

- Amphetamine effects with severe overdose
 - “Revved” up vital signs
 - MS changes: agitation, combativeness, violence
 - Diaphoresis
 - Hyperthermia
- Laboratory findings
 - Hyponatremia
 - Rhabdomyolysis
 - Metabolic acidosis



Effects of Ecstasy on Brain



Ecstasy

Treatment

- IVF
- Pressors if indicated (alpha agonists best)
- Benzodiazepines for agitation/seizures
- Slow correction of hyponatremia
- Watch for rhabdomyolysis
- Treat hyperthermia aggressively

Accessible Sympathomimetics

- Drugs for Attention Deficit Disorder

- Ritalin
- Adderall
- Vyvanse





Nexus

2C-B, 2C-I, 2C-E

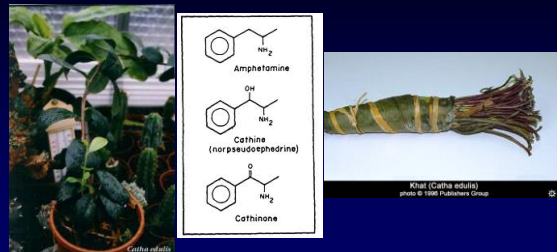
- Touted as a “middle” ground between Ecstasy and LSD
- Faster rush to hallucinations (20 min)
- Plateaus for 3-6 hours
- Rapid come-down (1-2 hours); fewer after-effects

Nexus

“If you are having a bad time on ecstasy, taking Nexus won't make you feel any better - it'll probably be worse.”

www.RaveSafe.com

Khat



Cathinone-derived Substances

“Khat, Kat, Red khat”

- Source: East Africa – leaves and stems chewed for effect
- Desired effects: CNS stimulant, euphoria
- Toxic Effects:
 - NMJ and DA pathway stimulation (cathine and cathinone-induced)
 - CVS: MI, cerebral hemorrhages, pulmonary edema
- Treatment: supportive

Cathinone-derived Substances

Bath Salts



Cathinone-derived Substances

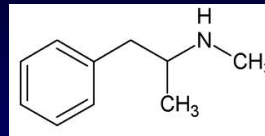
Bath Salts

- Bliss, Blue Silk, Cloud Nine, Drone, Energy-1, Ivory Wave, Lunar Wave, Meow-Meow, Ocean Burst, Pure Ivory, Purple Wave, Red Dove, Snow Leopard, Stardust, Vanilla Sky, White Dove, White Knight, White Lightening
- “Bath Salts” refers to crystalline, slightly oily characteristics
- Abuse in U.S. first documented by Poison Control Centers

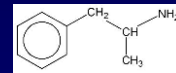
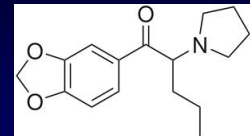
Cathinone-derived Substances

Bath Salts

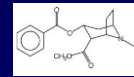
Mephedrone



MDPV



Amphetamine



Cocaine

Cathinone-derived Substances

Bath Salts

- Synthetic derivatives of cathinone
- Euphoric effects similar to MDMA, cocaine and other stimulants
- Purchased over internet and from head shops
- Recent L.A. City ban on sales

Cathinone-derived Substances

Bath Salts

- Short half-life – 30-90 min; effects last 2-4 hours
- Compulsive ‘re-dosing’ is common
- Stimulate release and inhibit reuptake of monoamine neurotransmitters
- Peripheral vasoconstriction from potent metabolite 4-methylephedrine

Cathinone-derived Substances

Bath Salts

- **Central Nervous System:**
 - Euphoria, anxiety, dysphoria, agitation
 - Paranoid psychosis, visual and tactile hallucinations
 - Hyperthermia, rigidity, myoclonus
 - Seizures
- **Cardiovascular:**
 - Tachydysrhythmias
 - Acute pulmonary edema

Cathinone-derived Substances

Bath Salts

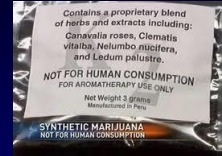
- Mydriasis, diaphoresis, tremor
- Rhabdomyolysis, renal failure
- Hyponatremia and cerebral edema (secondary to temporary SIADH and increased water ingestion)
- Aortic dissection
- Subarachnoid hemorrhage
- Ischemic colitis

Cathinone-derived Substances

Bath Salts

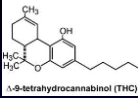
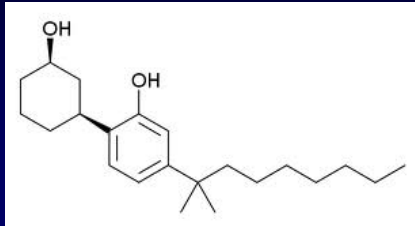
- Similar to management of amphetamine toxicity for most findings: hyperthermia, agitation, hyponatremia, hypotension
- Refractory hypertension (rare) not responding to sedation may respond to alpha-adrenergic antagonist (i.e. phentolamine)

Synthetic Marijuana K-2, Spice



Synthetic Marijuana K-2, Spice

Cannabicyclohexanol



Synthetic Marijuana K-2, Spice

- Marketing: "herbal incense"
- Popularity skyrocketed secondary to ability to evade most standard drug tests for THC
- 3/1/2011: sales of cannabicyclohexanol, JWH-018, JWH-073, CP-47,497, JWH-200, declared illegal by DEA.... Numerous synthetic derivatives have taken their place

Synthetic Marijuana K-2, Spice

- Effects very similar to marijuana, with varying degrees of potency, rush, and duration of action
- Psychosis is common, and may be prolonged, especially in patients with pre-existing psychiatric disorders

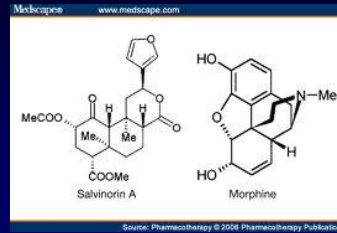
Synthetic Marijuana K-2, Spice

- Treatment is largely supportive
- Acute psychosis is best treated with short-term benzodiazepines
- Close follow-up is recommended – association with long-term psychosis

Salvia



Salvia



LSD

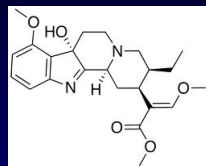
Salvia

- κ -Opioid receptor agonist
- D_2 receptor partial agonist
- Likely has some 5-HT agonist activity, but not consistently documented in studies

Salvia

- Dissociation, delirium, disorientation, diaphoresis
- Vivid memory recall, vertigo
- Feeling of warmth, hyperthermia is rare
- Treatment is supportive

Kratom



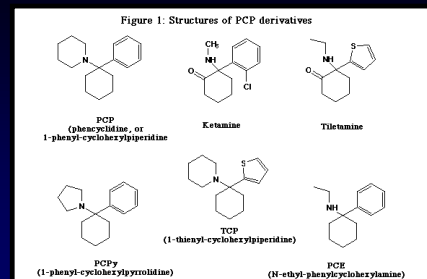
7-Hydroxymitragynine

Kratom

- Origins in Malaysia, Thailand
- Primary route is ingestion, but may be smoked
- Effects within 5-10 minutes, and last 2-5 hours
- Not regulated or controlled, easily purchased over internet

Kratom

- μ -opioid receptor agonist
- Miosis, analgesia, euphoria, respiratory depression with “ceiling” effect
- Respiratory depression may reverse with naloxone



Ketamine

Ket, Special K, Vitamin K, K

- Developed as an anesthetic
- Snorted, injected, smoked, ingested
- Targets the PCP binding site on NMDA receptor
- False-positive on PCP urine screen
- Ataxia, numbness, slurred speech, extreme hallucinations

Ketamine

“Since Ketamine is an anaesthetic, you may not notice if you fall and hurt yourself”

www.RaveSafe.com

Accessible “Ketamine” (Dextromethorphan)

- Robitussin DM
- Coricidin CCC
- Abuse has led to behind-the-counter and/or 18-and-over status in many states

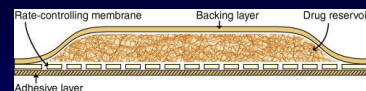
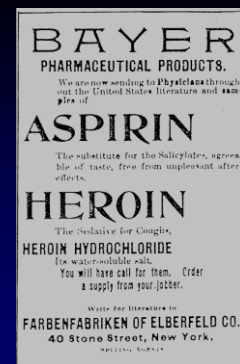


Dextromethorphan

- Shared chemical characteristics with PCP and ketamine: effects are similar, but less pronounced
- Derived from codeine: may produce opiate-like symptoms
- Present in numerous cough/cold preps

Antihistamines

- Benadryl (diphenhydramine)
- Chlorpheniramine
- Brompheniramine
- Effects of all of the above are similar to the anticholinergic syndrome of Jimson Weed, with higher risks of neurologic and cardiovascular toxicities



Fentanyl Patch

- Street value \$25-30 per patch
- Heating the patch liberates the compound
- Fatal intravenous misuse of transdermal Fentanyl

Reeves M D and Gimifer C J, MJA 2002 177 (10): 552-554

Prescription Opiates Presentation

- Opiate syndrome
 - Hypothermia, bradycardia, apnea, hypotension
 - MS changes: obtundation, coma
 - Miosis
 - Hallucinations in some patients
- Laboratory findings
 - Respiratory acidosis
 - Otherwise normal

Prescription Opiates Treatment

- One of few street drugs with an effective antidote
- Naloxone – antagonizes opiate receptors
- Can work within seconds
- Watch for withdrawal; may need to treat aggressively with benzodiazepines

Narcotic-containing preparations

- | | |
|------------------------|------------------------|
| • Allay | • Lorcet 10/650 |
| • Anexsia | • Lortab |
| • Anolor DH 5 | • Magesic #3 |
| • Bancap-HC | • Oncet |
| • Capital with Codeine | • Panacet 5/500 |
| • Co-Gesic | • Panlor |
| • Darvocet | • Percocet |
| • DHCplus | • Polygesic |
| • Dolacet | • Propacet 100 |
| • Dolagesic | • Pyragesc-C |
| • Duocet | • Roxioet |
| • E-Lor | • Roxilox |
| • Endocet | • Stagesic |
| • EZ III | • Tallisen |
| • Hycomet | • T-Gesic |
| • Hyco-Pap | • Tylenol with Codeine |
| • Hydrocet | • Tylox |
| • Hydrogesic | • Ugesic |
| • HY-PHEN | • Vanacet |
| • Lorcet 10/650 | • Vendone |
| | • Vicodin |
| | • Wygesic |
| | • Zydane |





Inhalants

Whipits, Poppers, Nitrous, Nitro, Amyl Nitrate; Butyl Nitrate; n-Nitrate; Amys, Rush

- Easily obtained
- Short-lived effects
- “Intensifies” emotions
- Often taken in group settings
- Hydrocarbon inhalants also gaining popularity

Inhalants

Presentation

- Acute: Abrupt hypotension, cardiac dysrhythmias, coma, seizures
- Chronic: immune suppression, methemoglobinemia, cerebellar degeneration
- Sudden death – can occur at any time
- Laboratory findings
 - Usually normal in acute settings

Inhalants

Treatment

- Supportive care
- Benzodiazepines for seizures
- No classic withdrawal syndrome

Inhalants

"Avoid using poppers while smoking or around candles, since you could end up in flames"

www.RaveSafe.com

Smarties n' KoolAid®



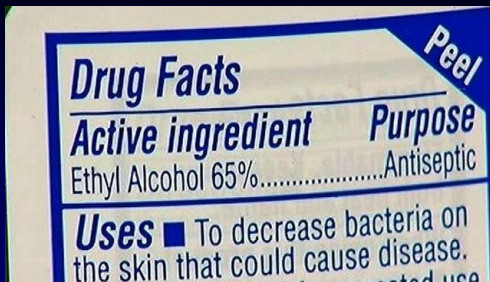
Smarties n' KoolAid®

- Crush Smarties into fine powder in wrapper, tear off one end, poured the powder into mouth, blow out Smarties dust
- Smarties and Kool-Aid® may be snorted
- "Just for fun"

The Cinnamon Challenge

- Objective swallow a spoonful of ground cinnamon in under 60 seconds without drinking, then upload the video to the Internet
- Coughing, gagging, vomiting; throat irritation, dyspnea, pneumonia
- "Just for fun"





Hand Sanitizer

- Easy access
- 500 mL bottles available at 99cent stores
- Recipes for “distillation”
 - Adding salt to gel
 - Thins out gel, to certain extent, to make more palatable

Teens Using Vodka Soaked Tampons to Get Drunk

Updated: Friday, 11 Nov 2011, 10:28 AM EST
Published: Friday, 11 Nov 2011, 7:27 AM EST

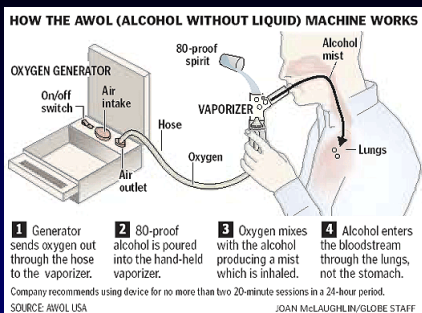
According to a report on KPHO.com, teens in the Phoenix area have been experimenting with a new way of getting drunk - vodka soaked tampons.

The absorbent devices are first soaked in vodka, according to the report, and then used.

Because they are completely saturated, the alcohol is absorbed directly into the bloodstream.

Officer Chris Thomas, a school resource officer, told KPHO.com that the activity is not limited to only girls. "Guys will also use it and they'll insert it into their rectums," he said.

Teens Using Vodka Soaked Tampons to Get Drunk



The Low-Tech Approach



Testimonials for Alternate Methods of Alcohol Consumption

- “It doesn’t make me have alcohol on my breath...”
- “I get drunk and don’t vomit...”
- “It’s a low calorie way to drink...”
- “It works faster...”
- “It’s a shorter buzz...”

_____ Party



Skittles® Party



Criminal Consequence

Teens expelled for selling prescription pills in school

Posted on January 29, 2013 by [Integration Services](#)



A drug ring was recently disbanded at a Wisconsin high school.

The non-medical use of prescription pills is one of the most common forms of addiction among adolescents in the United States. For some teens, it is just a matter of snatching the occasional painkiller from the family medicine cabinet, but, unfortunately a few individuals have taken advantage of the increasing demand for these substances on campus.

WTF Can We Do?

- Restrictions on purchase
- Teen substance abuse programs: most are focused on treatment
- Programs to prevent teen drug abuse are limited and narrow in scope
- “Just say no...”.....?